DOCUMENT RESUME

ED 125 251 FL 007 478

AUTHOR	Tarone, Elaine
TITLE	Some Influences on Interlanguage Phonology. Working Papers on Bilingualism, No. 8.
INSTITUTION	Ontario Inst. for Studies in Education, Toronto. Bilingual Education Project.
PUB DATE	Feb 76
NOTE	26p.; For related documents, see FL 007 475-479; Not available in hard copy due to marginal legibility of original
AVAILABLE FROM	Bilingual Education Project, The Ontario Institute for Studies in Education, 252 Bloor St. West, Toronto, Ontario, Canada M5S 1V6 (as long as supply lasts)
EDRS PRICE	MF-$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS	English (Second Language); Interference (Language Learning); Language Patterns; *Learning Characteristics; *Learning Processes; Phonetics; *Phonology; *Second Language Learning; *Syllables
IDENTIFIERS	*Interlanguage

ABSTRACT

This paper describes a preliminary study which focuses on the syllable structure of interlanguage and begins to identify some of the processes which shape that interlanguage. Adults learning English as a second language in a formal classroom situation were recorded as they described a series of pictures in English. Two subjects were native speakers of Cantonese, two were native speakers of Portuguese and two were native speakers of Korean. Their speech was transcribed and analyzed for syllable structure. The data support the following findings: (1) the syllable structure of the interlanguages examined was markedly different from that of the target language; (2) in the syllable structure of the interlanguages examined, both epenthesis and consonant deletion seemed to be used as strategies for syllable simplification, with the first-language background of the learner seeming to be related to a preference for one strategy over the other; (3) the dominant process influencing the syllable structure of the interlanguage phonologies appeared to be language transfer; (4) a preference for the open (consonant-vowel) syllable seemed to operate as a process independent of language transfer in influencing the syllable structure of the interlanguage phonologies; and (5) glottal stop insertion appeared only between words, possibly as a result of an attempt to produce lexical items as separate units in the speech stream. (Author)

Documents acquired by ERIC include many informal unpublished materials not available from other sources. ERIC makes every effort to obtain the best copy available. Nevertheless, items of marginal reproducibility are often encountered and this affects the quality of the microfiche and hardcopy reproductions ERIC makes available via the ERIC Document Reproduction Service (EDRS). EDRS is not responsible for the quality of the original document. Reproductions supplied by EDRS are the best that can be made from the original.

ED125251

Some Influences on Interlanguage Phonology

ABSTRACT

Elaine E. Tarone

This paper describes a preliminary study which focuses on the syllable structure of interlanguage and begins to identify some of the processes which shape that interlanguage.

Adults learning English as a second language in a formal classroom situation, were recorded as they described a series of pictures in English. Two subjects were native speakers of Cantonese, two were native speakers of Portuguese and two were native speakers of Korean. Their speech was transcribed and analyzed for syllable structure.

The data support the following findings:

I) the syllable structure of the interlanguages examined was markedly different from that of the target language;

2) in the syllable structure of the interlanguages examined, both epenthesis and consonant deletion seemed to be used as strategies for syllable simplification, with the first-language background of the learner seeming to be related to a preference for the strategy over the other;

3) the dominant process influencing the syllable structure of the interlanguage phonologies appeared to be language transfer;

4) a preference for the open (consonant-vowel) syllable seemed to operate as a process independent of language transfer in influencing the syllable structure of the interlanguage phonologies; and

5) glottal stop insertion appeared only between words, possibly as a result of an attempt to produce lexical items as separate units in the speech stream.

FL007478

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS COPYRIGHTED MATERIAL HAS BEEN GRANTED BY
OISE, Bilingual Education Project
TO ERIC AND ORGANIZATIONS OPERATING UNDER AGREEMENTS WITH THE NATIONAL INSTITUTE OF EDUCATION. FURTHER REPRODUCTION OUTSIDE THE ERIC SYSTEM REQUIRES PERMISSION OF THE COPYRIGHT OWNER."

BEST COPY AVAILABLE

Some Influences on Interlanguage Phonology[1]

Elaine E. Tarone

1. Introduction. One area of second language acquisition which research has largely overlooked until very recently has been the area of phonology. Most recent studies have centered upon the acquisition of morphemes, the auxiliary, and some higher-order structures (cf. Schumann's (1975) paper which provides an overview of research to date). I know of no studies prior to 1975 which have attempted to systematically gather performance data on the structure of the learners' interlanguage phonology.[2] A great many papers have been written in the past which claim to predict performance in interlanguage pronunciation by presenting contrastive analyses of the phonologies of English and various other languages -- but none of these, to my knowledge, present systematically gathered and analyzed performance data to validate those predictions.

2. Needed Research in Interlanguage Phonology. The study of interlanguage phonology may focus upon a great many variables. Several of the areas in which research is needed are listed below.[3]

2.1. Data Base. First, there is need for interlanguage researchers to begin accumulating a base of phonological data, collected and transcribed systematically. Such a common data base is essential in establishing the basic facts which must be accounted for by any theory of interlanguage phonology. The analysis of such a data base might profitably concentrate upon either segmental features (such as the "substitution" of individual speech sounds for others, or the distortions of individual speech sounds in interlanguage), or suprasegmental features such as stress, rhythm, intonation and syllabification in interlanguage.

2.2. Causes of Phonological Fossilization. An issue of primary psychological interest is the question of why it is that pronunciation often remains problematic even for advanced learners of the second language. Indeed, adult learners often report that matters of "accent" may continue to mark them as non-native speakers long after fine points of syntax, semantics or even style have been mastered. What is the cause of this phenomenal "fossilization" of phonology?

One possible explanation might be some kind of physiological habit formation. After all, the muscles of the tongue and mouth region have been practicing the production of one set of sound patterns for years, and it may be (as learners often insist) that the nerves and muscles needed to produce another set of sound patterns have atrophied so far as to prohibit accurate pronunciation of the second language. Such a physiological explanation need not be limited to muscles and nerves at the periphery -- perhaps some neural functions in the central nervous processes have atrophied somehow -- perhaps along the lines of Lenneberg's (1967) suggestion of lateralization of the cortical function, the "flexibility" of the brain has diminished with age and this lack of flexibility has affected pronunciation of the second language more than the syntax and semantics. Krashen and Harshman (1972) and Krashen (1973) raise questions about the physiological hypothesis, however, reanalyzing data used by Lenneberg, and dichotic listening data, and showing that lateralization seems to take place long before the end of the "critical period"[9] for language learning.

Krashen (in press) supports a hypothesis which falls into the second group of explanations for the fossilization of phonology -- the "psychological" explanations. Krashen suggests that the close of the critical period is related to the onset of Inhelder and Piaget's stage of formal operations; Krashen suggests that this stage, in which adolescents begin to consciously

construct abstract theories about the world, may inhibit "natural" language acquisition, including the acquisition of phonology. Another "psychological" hypothesis attempting to explain the fossilization of phonology in particular, is one based in psychological habit formation. It is becoming common for researchers to claim that language transfer probably has its strongest effect in the area of pronunciation. If this is true (and it has by no means been clearly demonstrated to date), and if language transfer is evidence for habit formation (some serious questions have been raised about this claim as well), then perhaps we might lay the cause of the difficulty of second language pronunciation at the door of psychological habit formation. That is, it may be that a learner's speech perception and production have become permanently influenced by the first language phonology so that s/he has become psychologically unable to perceive or produce a new phonology with any great facility. This type of psychological habit formation would not result from physiological causes, but rather would derive from the subject's psychological inability to alter the criteria used to categorize speech sounds.

A third type of explanation would stress the learner's underlying lack of empathy with the native speakers of the second language. Considerable work has been done by sociolinguists such as Labov[5] showing that patterns of pronunciation tend to be adopted when the speaker identifies with a particular social group. Guiora et al (1972) have shown that when empathy with native speakers of a second language is artifically induced, the pronunciation of the second language improves. Guiora feels that interlanguage pronunciation is a sensitive indicator of empathy, or the degree to which the language learner identifies with the speakers of the second language. Does the lack of empathy lead to a fossilized phonology?

It should be the function of research into interlanguage phonology to attempt to resolve this issue of the cause of phonological fossilization.

2.3. Processes Shaping Interlanguage Phonology. Another issue for research to deal with -- one which has already been touched upon -- is the relative importance of language transfer processes, first language processes, and other processes in shaping the interlanguage phonology. Several questions need to be investigated:

---- How does language transfer from the first language influence the interlanguage phonology and cause it to deviate from the second language? Which aspects of the interlanguage phonology are most influenced by the first language?

---- Are first language acquisition processes reactivated in learning to pronounce the second language? To what extent does the second-language learner behave like the first-language learner in the acquisition of phonology?

---- Or, are there other processes traceable neither to language transfer nor to the reactivation of first-language acquisition processes, which influence the shape of the interlanguage phonology?

2.4. Variability and Instability in Interlanguage Phonology. We know from work in sociolinguistics that pronunciation seems to be extremely sensitive to social situation; Dickerson (1975) has shown that this kind of variability exists in the interlanguage of the second-language learner as well as the language of the first-language learner. She has begun to isolate the factors which influence this variability of interlanguage phonology. Similar work needs to be done in investigating the instability of interlanguage phonology over time -- that is, from month to month and year to year. Of special importance is the issue of the influence of the classroom situation upon interlanguage phonology, and the extent of carry-over of certain patterns of pronunciation from the classroom to other situations.

3. Preliminary Study on the Syllable Structure of Interlanguage.

3.1. Focus of the Study. There are, then, a great many variables to study in the area of interlanguage phonology. No on study can begin to answer all these questions. This paper describes one preliminary study which (1) focuses on the syllable structure of the interlanguage, in an attempt to determine how it differs from the syllable structure of the second language, and which (2) begins to identify some of the processes which shape that interlanguage syllable structure.

3.2. Theoretical Background of the Study. In spite of the absence of empirical data, there have been some speculations as to the nature of the processes which might influence interlanguage phonology. Three separate influences on the shape of the interlanguage syllable structure might be suggested: language transfer, reactivated first language processes, and a universal preference for the open (CV) syllable.

The language transfer hypothesis would suggest that the learner would simply use the syllable structure from the first language in his attempt to communicate meaningfully in the second language. Thus, if the first language contains only syllables consisting of a vowel-consonant (VC) type, this hypothesis would predict that the learner would tend to transform the second-language syllables into VC types.

The second hypothesis would suggest that the second-language learner would tend to do what the first-language learner does with syllable structure. That is, difficult syllables would be simplified by the second-language learner in the same way that they are by the first-language learner. The nature of this hypothesis is best understood by considering the work of D.K. Oller (1974). Oller believes that second-language learners do not reactivate first-language

acquisition processes in the acquisition of their second-language phonology; rather, he has suggested that the processes which shape the interlanguage phonology are quite different from those which shape phonology in first-language acquisition. Oller makes this claim on the basis of a thorough examination of the literature which does exist on the phonologies of second-language learners -- a literature which is very sparse and unsystematically-reported. D.K. Oller (1974) has pointed to such phenomena as the reportedly characteristic epenthesis in the speech of second-language learners as evidence for his claim. He maintains that in first-language acquisition of phonology, it is most characteristic for learners under 36 months of age to simplify by reducing or deleting difficult sounds, as --

a) cluster reduction:
e.g., blue ----→ bue

b) final consonant deletion:
e.g., big ----→ bi

c) weak syllable deletion:
e.g., banana ----→ nana

However, in the data reported in the literature, second-language learners appear to use a very different strategy in attempting to pronounce difficult sounds:

a) instead of cluster reduction, second-language learners reportedly used vowel insertion (epenthesis) much more frequently:
e.g., tree ---→ təree

b) instead of final consonant deletion, second-language learners more commonly favored vowel addition (epenthesis):
e.g., big -----→ bigu

c) and where first-language learners deleted weak syllables, this phenomenon was reported to be very uncommon among second-language learners.

(Oller, 1974)

The literature apparently gives no indication of the strength of this reported tendency to epenthesize, nor of the existence of any strong tendency among

second-language learners to delete consonants as first-language learners do. D.K. Oller (1974) emphasizes the need for a systematically-described empirical data base on interlanguage phonology; he feels that such a data base would show that the processes shaping interlanguage phonology were different from those shaping first-language phonology.

If it is true that epenthesis is a common strategy in second-language learners' acquisition of phonology, there may be two alternative explanations for it: it may result from language transfer, or it may be the result of an alternative process described by Tarone (1972).

This third suggested influence on the shape of interlanguage syllable structure is a possible universal preference for the open (CV) syllable. Tarone (1972) has argued that the simple open syllable may be a universal articulatory and perceptual unit; that is, the articulators tend to operate in basic CV programs in all languages, and the various languages simply elaborate upon this program by adding various combinations of initial and final consonants. In stressful situations of various kinds, speakers have been shown to revert to very simple CV patterns of pronunciation in their native languages (see, for example, Kozhevnikov and Chistovich, 1965). In learning a second language, then, it would seem to be possible that any learner, regardless of first-language background, might tend to break difficult sound combinations into simple CV patterns, using the kind of epenthesis described by D.K. Oller.

In order to determine whether the reported tendency to epenthesize is a result of language transfer, or of a process of simplification towards a universal open syllable, we will have to examine attempts by speakers of a variety of first languages to learn the phonology of the same second language -- in this case, English. Many languages, such as Cantonese, have a fairly simple CV syllable structure, so that (based on predictions of contrastive analysis)

This is because, in order to show that interlanguage syllable structure errors do not result from language transfer, it is necessary to demonstrate clearly that the same sequence of vowels and consonants exists in the native language and the target language, and that the learner still makes syllable structure errors in trying to produce that sequence in the target language. A comparison of Cantonese and English, or Portuguese and English, shows that the number of such identical sequences of vowels and consonants in both languages is not large. A comparison of Korean and English, however, shows much more similarity of syllable structure, and thus provides much more opportunity for the researcher to separate out the relative influences of language transfer, and any universal CV simplification process which may exist.

3.3. Procedure and Subjects. In this preliminary study, six speakers were recorded as they described orally a sequence of pictures, narrating a story in the process. Each speaker was shown the same series of pictures. Previous experience with this method of data elicitation had shown it to be fairly effective in eliciting the same general English lexical items and grammatical structures from all subjects. (A possibly more orderly method might have been to ask each subject to read the same passage into a tape recorder; however, this procedure might have confounded the data with "reading pronunciation".) Two of the subjects were Cantonese speakers from Hong Kong, two were Portuguese speakers from Brazil, and two were native speakers of Korean. All the subjects were between 19 and 30 years of age.

Each subject's narration of the story was transcribed using a standard IPA (International Phonetic Alphabet) transcription with diacritics where needed to note deviation from a Standard American English transcription. (All six transcriptions are included in Appendix A of this paper.) Next,

one might expect Cantonese speakers learning English to break difficult sound combinations into CV syllable units as a result of language transfer. It would be hard, studying subjects whose first language was Cantonese, to find instances of syllable simplification in the interlanguage which could clearly be demonstrated to originate from causes other than transfer. However, speakers whose native languages have some of the same, relatively complex syllable structures as those appearing in the target language, and who still attempt to break those structures into simpler open syllables as they speak the interlanguage, provide clear evidence that some process other than language transfer is operating. In such cases, one might claim that a universal process of simplification towards an open or CV syllable is being evidenced.

3.3. The Syllable Structures of the Three First Languages in the Study.

Native speakers of three different first languages were studied in this project: Cantonese, Portuguese and Korean. A word about the syllable structures of these three languages may be helpful.[6] Cantonese and Portuguese are both considered to be relatively "open-syllable" languages; that is, the syllabic structure of both languages is fairly simple, with most syllables being of a consonant-vowel, or CV, variety. In Cantonese, "closed" syllables which may end in one of a limited number of consonants may occur. Consonant clusters occur primarily as syllables occur together, across syllable boundaries. In Portuguese, similarly, there is a limited number of permissible final consonants, but a somewhat larger number of consonant clusters permitted within a syllable. While Korean is also considered to be primarily an open-syllable language, it contains a much more complicated syllable structure, especially in its final consonant structure, than either Cantonese or Portuguese. Note that where Cantonese and Portuguese speakers learning ESL, make syllable structure errors it will be very difficult to trace the source of those errors to anything other than language transfer.

a score was obtained for each subject. This score noted the number of errors in syllable structure made by each subject. An error in syllable structure was categorized as (1) epenthesis, (2) consonant deletion, and (3) insertion of glottal stops. The score did not include the substitution of one consonant for another consonant, or of one vowel for another vowel, since such substitutions do not substantially alter the syllable structure.[7]

3.5. Results and Discussion.

In Table A, we see that about 20% of all the syllables attempted by each subject contained some sort of syllable structure error.

--Insert Table A about here --

In examining the overall use of the strategies of epenthesis and consonant deletion, displayed in Table B, it is immediately apparent that the subjects did not rely heavily on epenthesis as a strategy in altering syllable structure, as D.K. Oller's sources had suggested they might.

--Insert Table B about here --

Rather, the subjects used both epenthesis and consonant deletion. This would seem to indicate that, insofar as consonant deletion is a strategy used in the acquisition of first-language phonology, it may be possible that first-language acquisition processes are in fact reactivated to a certain extent in the acquisition of second-language phonology. However, if such a reactivation does take place, it does not seem to operate with great force. The two strategies of consonant deletion and epenthesis seem to affect the syllable structure with approximately equal force for most of the subjects. Different subjects do seem to prefer different strategies, however; the critical variable in their choice of strategies appears to be their native language background. In Table B we can see that the Cantonese and Korean speakers preferred consonant deletion as a strategy, while the

Portuguese speakers decidedly favored epenthesis as a strategy in simplifying syllable structure.

Table C shows each subject's performance in terms of the strategies used in simplifying either final consonants or consonant clusters.

--Insert Table C about here --

It is clear from Table C that most consonant deletion and epenthesis took place in the subjects' production of final consonants rather than of non-final consonant clusters. Where non-final consonant clusters were simplified, the subjects almost always used consonant deletion as a strategy; both consonant deletion and epenthesis were used in simplifying syllables that ended in consonants.

In the analysis of the data, all the errors, or points of deviation, between interlanguage and target language syllable structure, were cross-classified as to whether their origin could be reliably traced to language transfer or not. So, for example, the Korean speaker's:

[kəlas] for [klæs]

was classified as an error originating in language transfer, since Korean does not have any [kl] clusters. However, the same speaker's rendition of:

[sku:] for [skuəl]

was classified as non-transfer in origin. Since Korean has a word [kuəl] (meaning "ninth month"), [sku:] could not be caused by language transfer from the first language, Korean. In many cases, it was hard to tell whether an error was the result of language transfer or not. For example, the same speaker produced:

[tʰɛ̃] for [ðɛn]

where the final -n was omitted from the word "then". Korean does have syllables which end with a final [-n], so one might be inclined to exclude language transfer as a cause of this error. However, further investigation

shows that Korean has no words which end in [- n]. In cases like this, the error was called a language transfer error. Since one of the purposes of this study was to isolate clear cases of syllable structure errors in the interlanguage which clearly could not be caused by language transfer, whenever there was any doubt in the investigator's mind about the origins of any particular error, that error was classified as "language transfer" rather than "non-transfer".

--Insert Table D about here--

It is clear from Table D that the majority of errors in syllable structure made by the subjects were attributed to the influence of language transfer. But for each learner, there was a number of such errors which clearly could not be due to language transfer. Forty-seven percent of Korean Speaker #1's syllable structure errors could not be accounted for in terms of language transfer; this learner had the largest percentage of such "non-transfer" errors. For Portuguese Speaker #2, who had the smallest percentage of such errors, only 10% were clear cases of non-transfer errors.

--Insert Table E about here--

Table E contains an exhaustive list of all the syllable structure errors made by these learners which, in the investigator's judgment, could not be the result of language transfer. These non-transfer errors are listed together with permissible syllable sequences from the respective learners' native languages which contain the same (or nearly the same) sequence of vowels and consonants as the sequence in English which the learner failed to produce correctly. The examples of epenthesis, consonant deletion and glottal stop insertion shown in Table E cannot be accounted for in terms of language transfer, if the information contained therein regarding the learners' native language syllable structure is correct. Neither can those examples be accounted for entirely in terms of the reactivation of first-language acquisition processes, since epenthesis is

clearly one of the strategies used by these learners, and as D.K. Oller has pointed out, epenthesis is not a first-language acquisition strategy. Note that in every case, the result of consonant deletion and epenthesis is to "simplify" the second-language syllable structure -- that is, to modify it towards a basic consonant-vowel pattern. Since the consistent result of this pattern of epenthesis and consonant deletion is to modify the syllable structure towards a basic CV pattern, it is suggested here that that pattern may be a result of a universal preference for the open syllable, and for the CV syllable in particular. This universal preference may combine with other processes, such as language transfer, to produce an even stronger preference for the open syllable in the interlanguages of some learners; but clearly, the universal preference for the open CV syllable seems to be a process which operates independently of language transfer.

In examining glottal stop insertions, it is found that in <u>every</u> instance, the glottal stop is inserted at word boundaries -- usually when the first word ends with a vowel, and the next word begins with a vowel. The result of this insertion is usually the change the syllable structure to a consonant-vowel pattern. It seems likely that the insertion of glottal stops may be the result of an attempt to produce lexical items as separate units in the speech stream -- possibly as a consequence of teaching technique, or of the learners' greater familiarity with written English than with spoken English (see Tarone, 1972) -- in interaction with the hypothesized preference for the open syllable.

4. <u>Summary</u>. In summary, then, the data acculumulated in this preliminary study supports the following findings:

(a) the syllable structure of the interlanguage is often markedly different from that of the target language;

(b) in the syllable structure of the interlanguages examined in this study, both epenthesis and consonant deletion seemed to

be used as strategies for syllable simplification, with the first-language background of the learner seeming to be related to a preference for one strategy over the other;

(c) the dominant process influencing the syllable structure of the interlanguage phonology appeared to be language transfer;

(d) a preference for the open (CV) syllable seemed to operate as a process independent of language transfer in influencing the syllable structure of the interlanguage phonology; and

(e) glottal stop insertion appeared only between words, possibly as a result of an attempt to produce lexical items as separate units in the speech stream.

Appendix A:

Transcriptions of Six Subjects Learning ESL

Korean #1

ai θɪŋ:kə̆ ʃi:mes:æmɪtʃə̆ ... t̪ɛn:pʊrtn̥əsæke...
ðɛn:ə̆ ...ʃigo... ʾauʾ ... t̪ɛ̃ʃiwɔʾ... t̪ɛ̃ʃidrɔp̚ʾ... ʃidrɔp̚ʾ...
əʃisɪ:samples: ... ə̆nə̆kə̆lasɔ1:samples ...
ai1ɪlidonowʌrɪʃiduɪŋ... t̪ɛn ...ʾə ... ʃi ...
pʊrtn̥əʾɪnsɛk̚ʾtə̆ tʃɛk̚ʾt̪əsɛʾ... ʾə̆zə̆ ho:...
t̪ə̆sa:ə̆sæmɪtʃə̆ gɔ̃ ... ɔlgɔ̃ ... zədɔg̊ʾit̚ʾ...
lʊkslaikə̆ dɔg̊ʾfʌn ...

Korean #2

ʃime:əsæmɪtʃɪ ... ʃimekɪŋ ... əsæmɪʾ ... æn:ʃipʊrɪn: ...
pepəbæɪ ... æn:ʃitek̚ʾau: ... n̥ʃiyoʾwɔkɪŋno ...
aiθɪŋt̪ɛ̃ ... ʃigosʌmə̆sku:əsʌmðɪŋ... æn:ʃi ...
ʾn:ʃidrɔp̚ʾ ... sæms: ... so ... ʃi ... ʃipʊrɪnəbæ: ...
t̪ə:pepəhæs: ...ʾə... ho:... so ...ʃi ... sɜ̃p1ʾm̩ ... s... ʾm̩ ...
o: ... ʃisi: ...ʾə̃ hosæ̃:ʾɪʃisæ̃wɪtʃɪ: ... dɔʾ...
dɔ:g̊ʾit ... hɜ̃sæ̃wɪtʃə̆ ...

Cantonese #1

t̪ə̆gɜ̃ɣznemɪs ... dʒõ: ... ʾæn: ... ʃiːgoɪŋ ...
ʾə:tuhævə̆pɪʾn̥ɪkʻ ... æn: ...fɜ̃sʾəvʾɔ: ... ʃiə̆p̚ʾ ...
pɪpɛəs:əʾ dʒæm: sæ̃wɪtʃə̆... æn: ...ʃipʊʾtsɪʾɪnə̆bæ:k ...
ʾə̆m... ʃib1ɪŋ:z ...ʾəm ... ɔæ̃mɪʃ ...ʾænəʾ... bl̥æŋkə̆t̪ə̆ ...
wɪθhɜ̃anə̆weɪ: ... æn: ...
sʌdn̥li ... ʃi ... d1ɔps ... t̪əsæ̃wɪtʃə̆ ... bəʃidʌzə̆no ðæʾ...
æn:... wɛ̃ʃi ... 1ɪtʃəz:ðə̆ples ʾə... wɛəʃi ... p1ænstuhævə̆
pɪʾn̥ɪkə̆ ... ʃiə̆sp1ɛʾ... sp1ɛʾs:t̪ə̆b1æŋkə̆ts ...
ʾan ... ʾanə̆g1aʊ̃: ... æn t̪ɛ̃ ... ʃiteksaurə̆sæ̃wɪtʃə̆...

(cont.)

Cantonese #1 (cont.)

bʌʔ ... ʃidɪskʌvɚt̪æt̪ʰəsæ̃wɪtʃə̆wəzgɔ̃:n̪ ...
æn ... ʃidə̆zn̪oʔwai: ... æn ... ðærə̆zb̪kʌz ... ʔəm: ...
ʃidɪɔpsɪt̪ʰanə̆wɛɪ:ən ... t̪ə̆ dɔʔ ... dɔgʔz ... gɛʔ ... gɛrə̆t̪ə̆ ...

Cantonese #2

ʔəgɝ:Isə: ... fɪsɪŋhɝto:s ... wɪʃ ... dʒæm ...
ænaifɪŋə:ʃiɪstraintu:hæfəpɪʔnɪʔtʻ ... ænhigʻ ... ænhihæʔ ...
ʔænhihæʔ ... ænə̆ʃihæsʔɛvɪɪfɪŋ ... ɪɛdiænə ... ʃiwə ...
ʃiwəsohæpiə̆n: ... gɛtɪŋʔauəvn̪ə̆dɔə ... æn: ... ʃiwəso: ...
sʼʃʔ ... (unintelligible) ʃiwɔkə̆lɔŋt̪əɪo: æn: ... ə̆nʃidɪdə̆no ...
ɛə ... t̪ə ... t̪əsæʔwəsʻ ... wəsʻ ... ʔə̆ ... əʃ ...
ʃidɪ:n̪:otɪsəʔ ... notɪst̪æt̪ə̆sæ̃tʼə: ... wəsʻbɪokænə̄t̪ə
sæ̃wɪtʃə̆kemaut ... ænə: ... hi ... higotut̪əbitʃænə̆pe:wɪʃəsæn ...
... æn: ... aftə:waiɤʃi:fɛltʻhæʔhʌŋgɪiʔænʃiwants ...
ʃiwʌntətuʔitʼsʌmsæ̃wɪtʃə̆ ... ænə: ... ʃitɚkaut̪əsæt̪ə̆ʔə̆n: ...
ʃifauŋaut̪æt̪isɛtə̆ ... wəsbɪokə̆ ... ænə: ...
æ ənʃiwəs:ə̆n ... ʃiwəsə̆naʔʃʊɚwɛɚ ... wɛɚʃilɔst̪ə̆sæ̃wɪtʃə̆z ...
æn: ... ænanɳiʔʌt̪ɚhænə: ... t̪idɔ:saɚʔitɪŋ: ... hɝsæ̃wɪtʃə̆z ...

Portuguese #1

ðigɝə̆l ... pɪkʌp ... æ:bɔn: ... æn: ... pɪɪpɛɚdəhiz: ... ə ...
fudfɔɚ ... hɝfudfɔɚ ... ə:pikənik ... ə: ... hwɛn: ... ʔhi ...
wʌzgoɪŋtuðəpɪkənik ... ʃi: ... lastə̆ ... hɝs ... sandɹwɪʃ ...
æn: ... ʃi ... ʃidʌsəntə̆n ... noəbautʻɪt ... æn: ... hwɛ̃:s ...
ʃi ... əraivtə̆ ðəplesə̆ʔwɛɚ ... ʃiwantugo ... ʔə ... ʃi ... pʊɚtə ...
ʔə ... bæŋkə̆tə̆ ... ðəflɔɚ ... ænpɪɪpɛɚtuitʻ ... bʌtʻ ... hwɛ̃hi ...
gɛtə̆hɝ:bæg ... ʃi ... ʔɛ: ... notə̆ðæt ... hɝbægə̆wʌs: ... bə̆ɪokən: ...
ænðætʃilɔstə̆ ... hɝ ... sænwɪʃʻ ... ænʃi: ... bikemzvɛɚs ... o: ...
sɚpɪaizdə̆ ... ænə ... ðəfɝsθɪŋ ... ðəkemztuhɝmain:əzðæt ...
ʌmdɔgz ... wʌ:zitɪŋ ... hɝfud: ...

Portuguese #2

suzi ʔʷʌzə̰gʊrdə... vɛɪivɛɪigʊrdə̰gʒl... ʃi... ʃilaikʻ...
ʃilaikʔitʻ... vɛɪimʌtʃʻbikʌzʃizfæt... ʃizvɛrifætʻ...
ændə:... wʌndeiʃi... ʷʌndeʃipɪipɛərmɛnisænwɪʃ...
fɔɪgotə̰ ðə̰skul... ændi:... hwɛnṭə̰bigin... ʔə:... hwɛ̆hwɛ̆
hwɛ̃nə̰bigin... tuwɔkʻ... ɪnzɪ:... hwɛnə̰bigintuwɔkə̰...
ɪnðəfɔɪəstʻ... ʔəʔɪʔɪnṭigaɪdən... ɪnṭi...
ɪntʻʔɪnṭigaɪdən... ʃiʃilastə̰də̰tɪi... tsænwɪʃ... o:...
ʃigotə̰dihauzə̰... ænəbigɪnvɛɪivɛɪihʌŋgɪi... vɛɪivɛɪi
hʌŋgɪi... ænə̰ʃicɪaivɛɪimʌtʃʻ... bʌtʻ... m̩... jə̰̆...
ə̰bʌtʔə... ʃicɪaivɛɪivɛɪimʌtʃʻbʌtəti... tə̰̆... ʃihævə̰̆...
ṭi:... dɔgz: zistɪitə̰̆dɔgz... hævə̰̆ṭigaɪdən...
itə̰̆ṭilʌntʃ... ænipænsvɛɪivɛɪiwɛl...

Appendix B:

Gloss of Transcriptions of Six Subjects

Korean #1

I thinka she ma(kes) sammitcha ... then put 'n a sackay ...
then uh ... she go ... ou(t) ... the(n) she wa(lk) ... the(n) she drop ...
she drop?
uh she si(ts) someplace ... in a c/ə/lass or someplace ...
I really don' know what is she doing ... then ... uh ... she ...
put 'n a in sack to check the sa(ck) ... is a ho(le) ...
the sa ... uh sammitcha go(ne) ... all go(ne) ... the dog eat ...
looks like a dog fun ...

Korean #2

She ma(kes) a sammitchy ... she making ... a sammi(tch) ... an' she put in ...
paper ba(g) ... an' she take ou(t) ... 'n she go walking, no?
I thin(k) the(n) ... she go somea schoo(l) or something ... an' she ...
'n she drop ... sams ... so ... she ... she put in a ba(g) ...
the paper has ... a ... ho(le) ... so ... she ... surpr ... um ... s ... m ...
oh ... she see ... a ho(le) sa, i, sa(nd)witchy ... do(g) ...
dog eat ... her sa(nd)witcha ...

Cantonese #1

The girl's name is ... Joa(n) ... an' ... she's going ...
uh to have a pi(c)nic ... an' firs(t) of a(ll) ... she uho ...
p(r)epares a jam sa(nd)witcha ... an' ... she puts i(t) in a bag ...
um ... she brings ... um ... samish ... an' a ... blanketa ...
with her an (th)e way ... an' ...
suddenly ... she ... drops ... the sa(nd)witcha ... bu(t) she doesn' know tha(t)
an' ... whe(n) she ... reaches the place uh ... where she ... prans to have a
pi(c)nica ... she uh sprea ... sprea/?/s the brankets ...
on ... on (th)e grou(nd) ... an' the(n) ... she takes out a sa(nd)witcha ...
bu(t) ... she discover(s) that (th)e sa(nd)witcha was gone ...
an' ... she doesn' know why ... an' ... that is b'cause ... 'um ...
she drops it on (th)e way an' ... the do(g) ... dogs ... ge ... get ita ...

Cantonese #2

A gir(l) is uh ... fixing her toas(t) ... wif ... jam ...
an' I thin(k) uh she is trvin' to have a pi(c)nic ... an' he g ... an' he ha ...
an' he ha' ... an' uh she has everything ... ready an' uh ... she wa ...
she was so happy an' ... eating ou(t) of the doo(r) ... an' ... she was so ...
s, sh ... (unintelligible) she walk along the roa(d) an' ... 'n she didn' know
uh ... the ... the sa(ck) was ... was ... uh ... uh, sh ...
she di(dn't) noticea ... notice that (th)e sack uh ... was broken a(nd) the
sa(nd)witcha came out ... an' uh ... he ... he go to the beach an' uh p(l)ay
wif (th)a san(d) ...
an' ... afte(r) while she f-lt ha, hungry an' she wants ...
she wanted to eat some sa(nd)witcha ... an' uh ... she took out (th)a sacka an'
she found ou(t) tha(t) the sacka ... was brokea ... an' uh ...
a, an' she wasn' ... she wasa no(t) sure where ... where she los(t) (th)e
sa(nd)witches ...
an' ... an' on the other han(d)a ... the do(g)s are eating ... her sa(nd)witches

Portuguese #1

The girl ... pick up ... aah, bun .. an' prepareda his ... uh ...
food for ... her food for ... a picanic ... uh ... when ... he ...
was going to the picanic ... she ... losta ... her s ... sandawish ...
an' ... she ... she doesn'ta n ... know about it ... an' ... whe(n) s ...
she ... arrive to the placea where ... she want to go ... uh ... she ... puta
uh ... b(l)anketa ... the floor ... an' prepare to eat ... but ... whe(n) he
geta her bag ... she ... eh ... notea that ... her baga was ... baroken ...
an' that she losta ... her ... sanwish ... an' she ... becames ver's ... oh ...
surpriseda ... an' uh ... the firs' thing ... tha(t) cames to her min(d) is that
some dogs ... was eating ... her food.

Portuguese #2

Susie was a gooda ... very very gooda girl ... she ... she like ...
she like eat ... very much because she's fat ... she's very fat ...
and uh ... one day she ... one day she prepare many sanwish ...
for go to the school ... and, ee ... when the begin ... uh ... whe, whe ...
when (sh)e begin ... to walk ... in the ... when (sh)e begin to walka ...
in the forest ... uh, i, in the garden ... in the ...
int , in the garden ... she, she losta the t(h)ree ... sanwish ... oh ...
she go to the housea ... an' a begin very very hungry ... very very
hungry ... an' ah she cry very much ... but ... m ... ya ...
uh but uh ... she cry very very much but uh ti ... the ... she havea ...
the ... dogs the streeta dogs ... have i(n) the garden ...
eata the lunch ... an' (h)e pan(t)s very very well ...

FOOTNOTES

[1]The author wishes to thank Amy Sheldon, D.K. Oller, and Larry Selinker, who read and commented on a preliminary version of this paper.

[2]Dickerson (1975) reports a very thorough study on phonological variation in interlanguage, however.

[3]I am endebted for some of these ideas to the participants in John Schumann's session on phonology at the University of Michigan's Sixth Annual Conference on Applied Linguistics at Ann Arbor.

[4]The term "critical period" is used to describe an age range during which it is possible to learn a second language easily; after that period, it is suggested that the second language cannot be learned with the facility supposedly characteristic of children.

[5]Labov (1972), for example, shows that an adolescent's degree of inclusion in a particular peer group is highly correlated with the phonological patterns evidenced in that adolescent's speech.

[6]In Table B and Table C, certain syllables which are usually simplified in American English were not counted. Most notable syllables excluded from the counts in Table B and C are the expressions: "an'", as in "you an' I", and "and, uh", as in "I saw Joan and, uh, Tom."

References

Chao, Yuen Ren. 1947. Cantonese primer. Cambridge, Mass: Harvard University Press.

Cho, Seung-Bog. 1967. A phonological study of Korean. Uppsala, Sweden: Acta Universitatis Upsaliensis.

Dickerson, Lonna. 1975. The learner's interlanguage as a variable system. Paper presented at the Ninth Annual TESOL Convention, Los Angeles, California.

Guiora, A.Z. et al. 1972. The effects of experimentally induced changes in ego states on pronunciation ability in a second language: an exploratory study. Comprehensive Psychiatry. 13, 421-428.

Kozhevnikov and Chistovich, eds. 1965. Speech: Articulation and Perception. Moscow: Nauka. (Translation: JPRS: 30, 543, pub. Joint Publications Research Service: Washington, D.C.)

Krashen, S. 1973. Lateralization, language learning, and the critical period: some new evidence. Language Learning 23: 63-74.

Krashen, S. (In press). The critical period for language acquisition and its possible bases. To be published in the Annals of the New York Academy of Science.

Krashen, S. and R. Harshman. 1972. Lateralization and the critical period. Working Papers in Phonetics (UCLA) 23: 13-21.

Labov, W. 1972. The linguistic consequences of being a lame. Language in the inner city: studies in the Black English Vernacular. Philadelphia: University of Pennsylvania Press.

Lennaberg, E.H. 1967. Biological foundations of language. New York: John Wiley and Sons, Inc.

Oller, D.K. 1974. Toward a general theory of phonological processes in first and second language learning. A paper presented at the Western Conference on Linguistics, Seattle, Washington.

Schumann, J.H. 1975. Second language acquisition research: getting a more global look at the learner. A paper presented at the University of Michigan Sixth Annual Conference on Applied Linguistics, Ann Arbor, Michigan.

TABLE A:

Overall Percentage of Syllable Structure Errors

	Approximate # Syllables Attempted	# Syllable Structure Errors	Approximate % Errors
Korean #1	72	15	21%
Korean #2	72	15	21%
Cantonese #1	129	25	19%
Cantonese #2	148	36	24%
Portuguese #1	112	23	21%
Portuguese #2	144	23	16%

TABLE B:

Overall Preferred Strategies for Syllable Simplification[6]

	Consonant Deletion	Epenthesis
Korean #1	71%	29%
Korean #2	80%	20%
Cantonese #1	68%	32%
Cantonese #2	62%	38%
Portuguese #1	20%	80%
Portuguese #2	20%	80%

TABLE C:

Strategies Preferred in Simplification of Final Consonants or Consonant Clusters[6]

	Final Consonants		Consonant Clusters	
	Deletion	Epenthesis	Deletion	Epenthesis
Korean #1	10 (59%)	4 (24%)	2 (12%)	1 (5%)
Korean #2	10 (67%)	3 (20%)	2 (13%)	0
Cantonese #1	10 (40%)	8 (32%)	7 (28%)	0
Cantonese #2	13 (45%)	11 (38%)	5 (17%)	0
Portuguese #1	2 (11%)	11 (58%)	2 (11%)	4 (20%)
Portuguese #2	0	8 (80%)	2 (20%)	0

TABLE D:
Processes Underlying Interlanguage Syllable Structure Errors

	# Errors	# Errors due to Language Transfer	Non-Transfer Errors
Korean #1	17	9 (53%)	8 (47%)
Korean #2	15	11 (73%)	4 (27%)
Cantonese #1	25	19 (77%)	6 (23%)
Cantonese #2	29	21 (73%)	8 (27%)
Portuguese #1	19	16 (84%)	3 (16%)
Portuguese #2	10	9 (90%)	1 (10%)

TABLE E:

Syllable Structure Errors Apparently Not Due to Language Transfer

Subject	Target Sequence	IL Sequence	Permissible NL Sequence	Strategy
Korean #1	sɪtsʌmples	sɪ:sʌmples	kɪtsʰa	Deletion
	ho:l	ho:	ko:l	Deletion
	salɚə	sa:ə	salɕida	Deletion
	gɔn	gɔ̃	kan	Deletion
	gɔn	gɔ̃	kan	Deletion
	sæk	sæke	sək	Epenthesis
	laikɚədɔg	laikədɔgᵘ	kakta	Epenthesis
	ɔinsæk	əʔɪnsɛkᵘ	tsuye ɪt	Insertion
Korean #2	aut	au:	ut	Deletion
	skual	sku:	kual	Deletion
	ho:l	ho:	ko:l	Deletion
	gowɔkɪŋ	goʔwɔkɪŋ	oga̰ta	Insertion
Cantonese #1	ʤɔn	ʤɔ̃:	ʤon	Deletion
	bʌtʃi	bəʃi	matʃɔɪ	Deletion
	blæŋkət	blæŋkətə̆	kat	Epenthesis
	gerə̆t	gɛrə̆tə̆	kat	Epenthesis
	ədʒæm	əʔdʒæm	sɛ: tɕi	Insertion
	nowai	noʔwai	ŋoʰ wa:	Insertion
Cantonese #2	autəv	auəv	ut	Deletion
	sæk	sætə̆	[sək] [ʃsɛt]	Epenthesis
	sæk	sæ̃tʰə̆	" "	Epenthesis
	sæk	sɛtə̆	" "	Epenthesis
	tuit	tuʔitᵘ	tʃau i:u	Insertion
	sætɪŋ	sætʰʔə̆n	teŋiat ianwai	Insertion
	ɕiʌðɚ	t̪iˑ ʔʌt̪ɚ	lai a:	Insertion
	aɚitɪŋ	aɚ ʔitɪŋ	ka iatko	Insertion
Portuguese #1	blæŋkət	bəŋkə̆tə̆	problema	Epenthesis
	bægwəɪ	bəgə̆wʌs	igual	Epenthesis
	pleswɛɾ	plesə̆wɛɾ	gueño	Epenthesis
Portuguese #2	lasθɨ	lastə̆də̆tɨ	eʃtʳaŋo	Epenthesis